

**ENGINEERING THERMODYNAMICS**  
**BT-ME-ES305**

*Submission date:- 21-10-2024,  
Time:- 2:30 to 3:30 pm*

**Assignment -1**

**Questin-1:** Explain the concept of available and unavailable energy. When does the system become dead?

**Questin-2:** Derive an expression for-----

- a) Availability in non-flow systems
- b) Availability in steady flow systems

**Questin-3:**

Define the co-efficient of :

- (i) Volume expansion
- (ii) Isothermal compressibility
- (iii) Adiabatic compressibility.

**Questin-4:**

What is the difference between an ideal and a perfect gas ?

**Questin-5:**

What is a  $p$ - $v$ - $T$  surface ? Draw a portion of a such a surface.

**Questin-6:**

What is the critical state? Explain the terms critical pressure, critical temperature and critical volume of water?

**Questin-7:**

What is quality of steam? What are the different methods of measurement of quality?

**Questin-8:**

Why cannot a throttling calorimeter measure the quality if the steam is very wet? How is the quality measured then?

**Questin-9:**

Why does isothermal compression need minimum work and adiabatic compression maximum work?

**Questin-10:**

What is a polytropic process? What are the relations among  $p$ ,  $v$  and  $T$  of an ideal gas in a polytropic process?